

Evaluation of the state of health of motor vehicle operators driving under the influence of alcohol in the years 2004, 2007 and 2010 in Kielce Region

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Makara-Studzińska M, Latała-Łoś E, Łoś R. Evaluation of the state of health of motor vehicle operators driving under the influence of alcohol in the years 2004, 2007 and 2010 in Kielce Region. J Pre-Clin Clin Res. 2012; 6(2): 118-121.

Abstract

Introduction: Annual reports by the Police Headquarters provide information about a big problem associated with the operation of motor vehicles by drunk drivers which, unfortunately, contributes to many tragic events on the roads. In 2010 alone, drunk road users were involved in 4,524 road accidents.

Objective: Presentation of the health situation of the population of drivers reporting for medical and psychological examinations to the Regional Occupational Health Centre in Kielce, based on decisions by the road traffic control authorities for the area of the Kielce Region, at three year intervals.

Material and methods: Analysis of the state of health covered drivers who reported to the Regional Occupational Health Centre in Kielce due to operating a motor vehicle under the influence of alcohol, or in the state of intoxication. In 2004, from among 549 drinking drivers the majority were males (538), i.e. 98.2% aged 17-69; of these, 70% were rural inhabitants. Similarly, in the subsequent years, males living in the rural areas also prevailed, and constituted 98.6% of the 1,409 drivers examined (1,390), and in 2010 as many as 97.5% of 1,816 drivers examined (1,771).

Results: Analysis of the state of health of the examined group of drivers referred to the Regional Occupational Health Centre by the decision of police authorities showed deviations from the normal state in many drivers.

Conclusions: The studies contributed to the detection of many disorders in the group of drivers examined, frequently including those which required intensive treatment in hospital conditions. In the subsequent years, an increasing number of drivers operating vehicles under the influence of alcohol or other psychoactive substances was observed.

Key words

drivers, alcohol, state of health, addiction

INTRODUCTION

The problem of excessive alcohol consumption occurs not only in Poland, but in all countries, and causes a great deal of damage concerning, among other things, the health and occupational activity of an alcohol abuser, as well as disturbances in family relationships. According to the data from literature, the causes of this phenomenon are complex and are sought for in, e.g. the amount and way of consumption of alcoholic beverages, lack of social disapproval for alcohol consumption, incapability of coping with so-called civilization stresses [1]. The report developed within the research project commonly undertaken by the EURO CARE and Confederation of Family Organisations in the European Union indicates that 14% of males and 4% of females admit that they abuse alcohol or suffer from alcoholic disease. According to the State Agency for the Prevention of Alcohol-Related Problems (PARPA), for many years in Poland a constant increase has been observed in

the consumption of alcohol *per capita*. During the period 1950-1980, the registered consumption of alcohol gradually increased from 3 up to approximately 8 litres (including population groups with low or actually zero consumption, i.e. children, the elderly and those seriously ill. In the 1990s, the mean alcohol consumption *per capita* was from 10-11 litres of pure alcohol. The inhibition of the upward tendency was noted during the period 1995-1996. In the second half of the 1990s, consumption was 7-8 litres of 100% ethyl alcohol. In 2009, an average Pole consumed as much as almost 9 litres of pure alcohol. It is estimated that in Poland 10% of the population abuse alcoholic beverages, including 800,000 of those addicted.

Data concerning the situation on the roads are terrifying. According to a report by the Police Headquarters [2] the consumption of alcohol by a driver makes safe driving impossible, and unfortunately contributes to many tragic events on roads. In 2010, intoxicated drivers were involved in 4,524 road accidents (11.6% of the total number of accidents), with 455 fatalities (11.6% of the total number of fatalities), and 5,620 people were injured (11.5% of the total number of those injured). The fact that in 2010 a decrease was observed in the number of drivers under the influence of alcohol,

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Received: 14 April 2012; accepted: 9 November 2012

compared to 2009, is not comforting – the statistics still remain terrifying. In 2010, in the group of intoxicated drivers, 77% of accidents were caused by the drivers of passenger cars, and in the Kielce Region alone 45 people died in such accidents.

OBJECTIVE

The objective of the study is presentation of the health situation of the population of drivers who in the years 2004, 2007 and 2010 reported to the Regional Centre of Occupational Medicine in Kielce for medical and psychological tests, based on the decision by the traffic control authorities of the Kielce Region, in accordance with Article 122, Clause 1, Act 3 of the Act in the Matter of Road Traffic of 27 June 1997, with later amendments, i.e. in relation with operating motor vehicles under the influence of alcohol. An attempt was also undertaken to analyse the relationship between the appointed dates of health check-up and the category of driving licence possessed. The state of health of 3,774 drivers was analysed. The mode of referring to the examinations is established by the Regulation by the Minister of Health of 7 January 2004 in the matter of health check-up of drivers and individuals applying for driving certification (Official Journal No. 2, Clause 15). According to this mode, medical examinations of individuals mentioned in Article 122, Act 1, Clauses 2-5 of the Act in the Matter of Road Traffic, are carried out by the regional centres of occupational medicine.

MATERIAL AND METHOD

Analysis covered the state of health of drivers referred to the Regional Centre of Occupational Medicine in Kielce due to operating a motor vehicle under the influence of alcohol or in the state of intoxication. Among 3,774 drivers examined, males dominated – 98.0% (3,699), aged 17-80. According to the regulations, medical examinations of individuals mentioned in Article 122, Act 1, Clauses 2-5 of the Act in the Matter of Road Traffic, are carried out by the regional centres of occupational medicine. The set of tests performed in drivers, to which they expressed their consent, consisted of a wide scope of medical and psychological examinations. In all drivers from the group analyzed, laboratory tests were performed, i.e. fasting blood glucose level, biochemical tests – GGT, ALT, AST, level of total cholesterol, specialist consultations – ophthalmological, laryngological, and in some patients – psychological, ECG (drivers aged over 55), and assessment of the vestibular system.

While analyzing the health status of the group of drivers examined, the results of tests performed were considered as positive measures of the state of health, as well as pathological changes concerning the cardiovascular system, disorders of the hearing and vestibular organs, pathologies of the organ of vision and disorders of the nervous system.

RESULTS

The study group covered 3,774 drivers – 3,699 males (98.0%) and 75 females (2%), aged 17-80, with the largest group being those aged 21-30 – 31.2% (1,180) (Fig. 1, 2, 3).

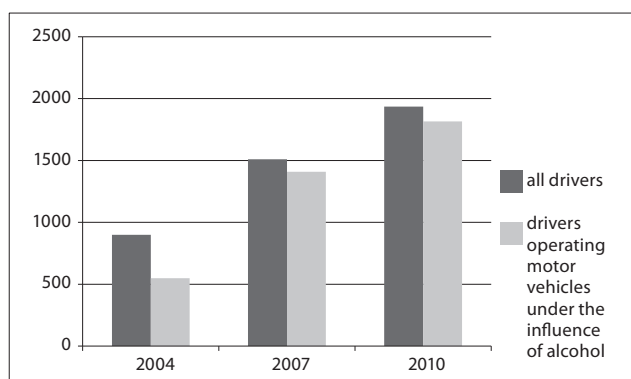


Figure 1. Number of drivers surveyed operating motor vehicles under the influence of alcohol and totally surveyed in different years

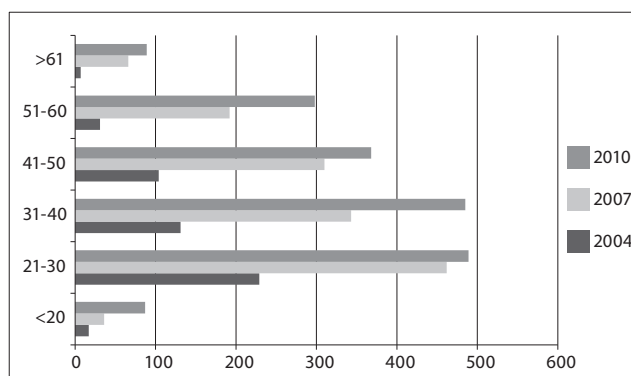


Figure 2. Number of drivers surveyed in each year in relation to age

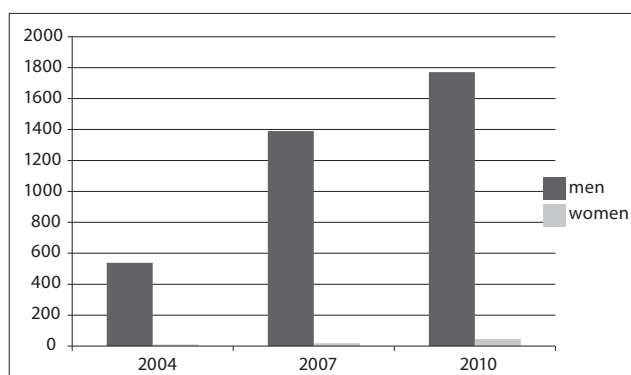


Figure 3. Number of drivers surveyed in relation to gender

Analysis of biochemical blood parameters covered a glucose test, obligatory in drivers, and additionally, cholesterol level and hepatic parameters were determined. The majority of drivers examined had a normal blood glucose level; nevertheless, in 468 of them (12.4%), higher than normal levels were observed, and in 42 (1.1%) – diabetes was confirmed (it should be mentioned that in 23 cases this disease was newly diagnosed, whereas in the remaining patients diabetes was treated, but not fully controlled). In the group of drivers in the study, the total cholesterol level test was additionally performed. In 541 cases (14.3%) abnormal values were observed and the treatment of hypercholesterolemia was ordered, both dietetic and pharmacological. In order to exclude alcohol-induced liver damage the levels of GGT, ALT, AST were determined. Alcohol-related liver impairment may occur in individuals who chronically abuse alcohol, or those who consume high amounts of alcohol occasionally. When asked about alcohol consumption during medical history

taking, most drivers replied that they did not consume alcohol or did so only on special occasions (e.g. holidays and birthdays). They often denied alcohol consumption, despite evident symptoms of alcohol abuse and abnormal test results (especially GGT). In the tests performed, an increased activity of aminotransferases was noted (AST, ALT, GGT) in 394 cases (10.4%). However, it should be remembered that even patients with severe alcohol-induced hepatitis show normal or almost normal ALT values [3]; nevertheless, in the majority of them a significant increase is observed in the level of gamma-glutamylotranspeptidase (GGT) – this enzyme is induced by ethanol (the highest value observed in the presented studies was 1,222.0 U/l) [3, 4]. Analysis of the state of the motor and nervous systems indicated that during medical history taking more than a half of the drivers reported back pain. In 133 (3.5%) cases these were complaints related with confirmed degenerative changes in the spine, congenital defects (of spondylolisthesis type), and impairment of intervertebral disc. The data from literature show that back pain syndromes are among the greatest health problems in operators of motor vehicles. Studies conducted at the Institute of Occupational Medicine in Łódź showed that 66% of the drivers examined complain of back pain located in the neck and lumbar sections of the spine. These disorders are most frequently diagnosed in the drivers of trucks, coaches and operators of heavy earth moving equipment [4]. Apart from this, in the group of drivers, 14 cases of epilepsy were diagnosed (0.3%), which excluded the capability for operating motor vehicles (negative decisions were made with the indication of check-up examination after a 5-year period without attacks of seizures and administration of drugs). It should be mentioned that the regulations currently in effect, introduced in June 2011, brought about new regulations concerning decision-making in drivers suffering from epilepsy. In 15% of the drivers in the study, changes in motor organs were observed which were the result of injuries (lack of phalanges after amputations) or changes after peripheral nerves injury (e.g. paralysis of the ulnar nerve). The state of the drivers' cardiovascular system was also analyzed. In 26% of cases, arterial hypertension was diagnosed requiring pharmacological treatment. In a half of the drivers this was hypertension with organ complications (cardiac hypertrophy, changes in the fundus of the eye). The abnormality which occupied the second position according to the frequency of occurrence among the drivers examined was cardiac arrhythmia (304 drivers -8%) in the forms of: sinus tachycardia, ventricular extrasystoles, atrial fibrillation, atrio-ventricular conductivity disorders (blocks of the left or right branch of the His bundle).

The psychical condition of the drivers was examined, with consideration of the following functions: reaction time and its stability, determination of velocity of moving objects, spatial vision, sensitivity of the kinesthetic sense, sensitivity to illumination and mesopic vision, speed and precision of perception, divisibility and concentration of attention, as well as personality and temperament traits. The following disorders were most frequently observed in the psychological tests performed in drivers with negative decisions issued: in motor efficacy tests (prolonged reaction time, decreased visual-motor coordination, in personality inventories (personality disorders), in general intelligence tests (Wechsler Intelligence Scale) – low results on the border of mental lethargy.

In the group of drivers in the study, disorders concerning the organ of vision were also found, primarily vision defects requiring correction, followed by cataract and glaucoma. Bilateral hearing loss was diagnosed in 868 (22.9%) from among 3,774 drivers examined, mainly of a conductive or mixed type. In some drivers, a high degree of hearing loss was diagnosed which required the use of a hearing aid.

In the presented study, in 320 (8.4%) drivers evident symptoms of alcohol abuse were observed (in many of them these symptoms were confirmed by the AUDIT test – a result of over 8 scores). The majority were referred to ambulatory detoxification centres located in the vicinity of their place of residence, 11 (0.2%) were referred to hospital for treatment of the effects of alcoholism diagnosed in organs. The reminder declared the undertaking of therapy within local support groups (some had previously participated, e.g. in AA meetings, that they mobilized themselves after 'withdrawal of driving licence'[5]. In 250 cases (6.6%), at least three symptoms of abstinence symptoms were observed. These were most frequently: increased sweating and sleep disorders, tachycardia and other cardiac arrhythmias, arterial hypertension, and muscular tremors. In many cases, an increased GGT value was found – a recognized index of toxic liver impairment, including damage caused by alcohol [6].

Apart from this, in some drivers diseases were disguised which are contraindications for operating motor vehicles. In 720 (19.2%) drivers vision defects were found that required correction. Apart from the effects of excessive consumption of alcohol, the state of hearing and motor organs of the drivers was especially alarming. In approximately 20% of them a considerable hearing loss was diagnosed, and some were recommended to use a hearing aid. The causes related with such a state of hearing in drivers may be primarily noise and other ototoxic agents, to which they had been exposed in association with occupational activity, but also the inflammatory states of the ears, often chronic and untreated. Many drivers reported neck and/or lumbar spine pain, and this most often concerned drivers with driving licence categories C and D, exposed to overloading of the spine in relation with the occupation performed.

A relationship was also found between the date of the subsequent medical and psychological examination and type of driving licence category possessed by the drivers before being stopped by the police. Drivers with categories B and T more frequently had more distant dates of health check-ups determined than drivers with higher driving licence categories. In individual years, the drivers had more rarely issued the decision that concerned capability for driving for an indefinite period of time, especially those who possess so-called higher categories.

DISCUSSION

Based on the examinations carried out in relation with the decision by the police authorities, due to driving under the influence of alcohol or in the state of intoxication, a total number of 3,774 decisions were issued. In many drivers, analysis of the health status of the drivers examined showed deviations from the normal state. Some of the symptoms or disorders observed could be associated with an excessive consumption of alcohol, while the remainder – with other causes not related with alcohol. With all certainty it should be

stated that the group of 3,771 drivers who operated vehicles under the influence of alcohol behaved in a risky way and exposed themselves and others. Similar observations have been made by other researchers [7]. The data from literature show that already with the level of alcohol in the blood of 0.1‰ (allowable in Poland) concentration disorders and prolonged reaction time are observed, there may occur problems with the perception of details (lights, signs) on the road [8, 9, 10]. With higher concentrations of alcohol in the blood these symptoms are obviously intensified. This is confirmed by observations made during the examinations of drivers reporting to the Regional Centre of Occupational Medicine for tests. While carrying out an evaluation of the state of health of this group of drivers, special attention was devoted to the analysis of so-called somatic and psychological effect of alcohol abuse. Some disorders in the state of mental health and inadequate personality traits described in drinking drivers have been mentioned in many reports, which confirms the correctness of the methodology of the psychological examination applied [11].

CONCLUSIONS

The presented analysis concerned the state of health of drivers referred to the Regional Centre of Occupational Medicine by traffic control authorities due to operating motor vehicles under the influence of alcohol, or were intoxicated. The studies undoubtedly contributed to the detection of many disorders in the group of drivers examined, including some which require intense treatment in ambulatory or hospital conditions. The problem of drinking among road traffic drivers falls within a multidisciplinary domain of specialists in occupational medicine [12]. This indicated that there is a need for cooperation with specialists in psychology and psychiatry, and also often in toxicology. Many researchers undertake the problem of the implementation of educational actions within prophylactic-promotion programmes, biased not only towards the health problems, but also a health-

promoting life style, including adequate nutritional habits and principles of the so-called culture of alcohol consumption [13,14].

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